Patent Claims

Sub B1

1. Nucleic acid which comprises a sequence selected from

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(a) the sequences according to SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 5,

(b) part sequences, which are least 14 base pairs in length, of the sequences defined under (a),

(c) sequences which hybridize with the sequences defined under (a) in 2 x SSC at 60°C, preferably in 0.5 x SSC at 60°C, particularly preferably in 0.2 x SSC at 60°C,

(d) sequences which exhibit at least 70% identity with the sequences defined under (a), between position 1295 and position 2195 from SEQ ID NO: 1, or between position 432 and position 1318 from SEQ ID NO: 3, or between position 154 and position 1123 from SEQ ID NO: 5,

(e) sequences which are complementary to the sequences defined under (a), and

(f) sequences which, on account of the degeneracy of the genetic code, encode the same amino acid sequences as the sequences defined under (a) to (d).

2. Vector which comprises at least one nucleic acid according to Claim 1.

3. Vector according to Claim 2, characterized in that the nucleic acid is functionally linked to regulatory sequences which ensure the expression of the nucleic acid in prokaryotic or eukaryotic cells.

4. Host cell which contains a nucleic acid according to Claim 1 or a vector according to Claim 2 or 3.

5. Host cell according to Claim 4, characterized in that it is a prokaryotic or eukaryotic cell.

6. Host cell according to Claim 5, characterized in that the prokaryotic cell is E.coli.

7. Host cell according to Claim 5, characterized in that the eukaryotic cell is a mammalian cell or an insect cell.

8. Polypeptide which is encoded by a nucleic acid according to Claim 1.

9. Acetylcholine receptor which comprises at least one polypeptide according to Claim 8.

10. Process for preparing a polypeptide according to Claim 8, which comprises

(a) culturing a host cell according to one of Claims 4 to 7 under conditions which ensure the expression of the nucleic acid according to Claim 1, and

(b) isolating the polypeptide from the cell or the culture medium.

11. Antibody which reacts specifically with the polypeptide according to Claim 8 or the receptor according to Claim 9.

12. Transgenic invertebrate which contains a nucleic acid according to Claim 1.

13. Transgenic invertebrate according to Claim 12, characterized in that it is Drosophila melanogaster or Caenorhabditis elegans.

14. Process for producing a transgenic invertebrate according to Claim 12 or 13, which comprises introducing a nucleic acid according to Claim 1 or a vector according to Claim 2 or 3.

15. Transgenic progeny of an invertebrate according to Claim 12 or 13.

16. Process for preparing a nucleic acid according to Claim 1, which comprises the following steps:

(a) carrying out an entirely chemical synthesis in a manner known per se, or

(b) chemically synthesizing oligonucleotides, labelling the oligonucleotides, hybridizing the oligonucleotides to the DNA of an insect cDNA library, selecting positive clones and isolating the hybridizing DNA from positive clones, or

(c) chemically synthesizing oligonucleotides and amplifying the target DNA by means of PCR.

17. Regulatory region which naturally controls transcription of a nucleic acid according to Claim 1 in insect cells and ensures specific expression.

18. Process for discovering novel active compounds for plant protection, in particular compounds which alter the conducting properties of receptors according to Claim 9, which comprises the following steps:

(a) providing a host cell according to one of Claims 4 to 7,

(b) culturing the host cell in the presence of a compound or a sample which comprises a multiplicity of compounds, and

(c) detecting altered receptor properties.

19. Process for discovering a compound which binds to receptors according to Claim 9, which encompasses the following steps:

(a) bringing a host cell according to one of Claims 4 to 7, a polypeptide according to Claim 8 or a receptor according to Claim 9 into contact with a compound or a mixture of compounds under conditions which permit interaction of the compound(s) with the host cell, the polypeptide or the receptor, and

(b) determining the compound(s) which bind(s) specifically to the receptors.

20. Process for discovering compounds which alter the expression of receptors according to Claim 9, which comprises the following steps:

(a) bringing a host cell according to one of Claims 4 to 7 or a transgenic invertebrate according to Claim 11 or 12 into contact with a compound or a mixture of compounds,

(b) determining the receptor concentration, and

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(c) determining the compound(s) which specifically influence(s) the expression of the receptor.

21. Use of at least one nucleic acid according to Claim 1, one vector according to Claim 2 or 3, one regulatory region according to Claim 16 or one antibody according to Claim 11 for discovering novel active compounds for plant protection or for discovering genes which encode polypeptides which are involved in synthesizing functionally similar acetylcholine receptors in insects.

Add A3

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